

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. The following listing provides the amended claims with deleted material crossed out and new material underlined to show the changes made.

Listing of Claims:

1. (Currently Amended) A method of defining ~~routing~~ a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the method comprising:

a) performing a path search to produce a set of connected route-segment expansions between said start and target geometries ~~producing at least one potential route segment;~~

b) during the path search,

i) identifying, from a first route-segment expansion, a second route-segment expansion and a third route-segment expansion;

ii) discarding the second route-segment expansion because connecting the first route-segment expansion and second route-segment expansion would create an acute angle in the route;

iii) maintaining the third route-segment expansion because connecting the first route-segment expansion and the third route-segment expansion would not create an acute angle in the route.

~~testing the at least one potential route segments to determine whether it creates an acute angle in the route; and~~

~~_____ c) _____ preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route.~~

2. (Currently Amended) The method of claim 1 wherein an acute angle is created in the route when a ~~route segment in the route connects with a start or target geometry~~ two route segment expansions connect at an angle of less than 90°.

3. (Currently Amended) The method of claim 2 further comprising: ~~;~~
before step a), defining at least one border region about the start or target geometry; and
defining at least one routing rule associated with the border region; ~~wherein step b)~~
~~comprises:~~

determining whether ~~the potential~~ a route-segment expansion is within the border region;
and

upon determining that the ~~potential~~ route-segment expansion is within the border region,
testing the ~~potential~~ route-segment expansion to determine if the ~~potential~~ route-segment expansion meets the associated routing rule.

4. (Currently Amended) The method of claim 3 wherein the routing rule prohibits particular routing directions within the border region that would result in an acute angle being formed at a connection point between a route-segment expansion in the route and a start or target geometry.

5. (Original) The method of claim 3 wherein:
the border region neighbors a side of the start or target geometry having a vertical or horizontal orientation; and

the routing rule prohibits diagonal routing directions within the border region.

6. (Original) The method of claim 3 wherein:

the border region neighbors a side of the start or target geometry having a diagonal orientation; and

the routing rule prohibits vertical or horizontal routing directions within the border region.

7. (Original) The method of claim 3 wherein the border region is defined to have a thickness that is equal to a minimum length of a route segment specified by a predetermined design rule.

8. (Original) The method of claim 7 wherein the routing rule associated with the border region specifies that all route segments in the border region have the same routing direction.

9. (Currently Amended) A method of ~~routing~~ defining a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the method comprising:

a) during said routing:

i) producing a set of route-segment expansions comprising at least two potential route-segment route-segment expansions;

ii) testing the potential route segment a route-segment expansion to determine whether it would create creates an acute angle in the route;

iii) preventing the at least one potential route segment tested route-segment expansion from being included in the route between the start and target geometries if upon determining that the tested route-segment expansion potential route segment produces would produce an acute angle in the route;

d) iv) including the tested route-segment expansion ~~potential route segment~~ in the route between the start and target geometrics ~~upon determining that the potential route segment~~ if the tested route-segment expansion would ~~does~~ not produce an acute angle in the route; and

e) v) iteratively repeating steps i), ii), iii), and iv) ~~a), b), c), and d).~~

10. (Currently Amended) The method of claim 9 wherein:

~~a route segment comprises an interconnect line or a via; and~~

an acute angle is created in the route when a ~~route segment~~ route-segment expansion in the route connects with another ~~route segment~~ route-segment expansion in the route at an angle of less than 90°.

11. (Currently Amended) The method of claim 10 wherein ~~step b)~~ testing comprises:

referring to a pretabulated configuration table to determine whether the ~~potential route segment~~ route-segment expansion creates an acute angle in the route.

12. (Original) The method of claim 11 wherein the configuration table is a line-to-line configuration table that contains various connection configurations between two interconnect lines and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

13. (Original) The method of claim 12 wherein the line-to-line configuration table contains connection configurations where at least one of the two interconnect lines has directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°.

14. (Original) The method of claim 11 wherein the configuration table is a line-to-via configuration table that contains various connection configurations between an interconnect line

and a via pad of a via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

15. (Original) The method of claim 14 wherein the line-to-via configuration table contains connection configurations where the interconnect line has directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°.

16. (Original) The method of claim 14 wherein the line-to-via configuration table contains connection configurations of via pads having different shapes.

17. (Original) The method of claim 11 wherein the configuration table is a via-to-via configuration table that contains various connection configurations between a first via pad of a first via and a second via pad of a second via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

18. (Original) The method of claim 17 wherein the via-to-via configuration table contains connection configurations of via pads having different shapes.

19. (Currently Amended) A computer readable medium that stores a computer program for routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the computer program comprising sets of instructions for:

- a) performing a path search to produce a set of route-segment expansions between said start and target geometries producing at least one potential route segment;
- b) during the path search,
 - i) identifying, from a first route-segment expansion, a second route-segment expansion and a third route-segment expansion

~~_____ ii) discarding the second route-segment expansion because the combination of the first route-segment expansion and second route-segment expansion would create an acute angle in the route;~~

~~_____ iii) maintaining the third route-segment expansion because the combination of the first route-segment expansion and the third route-segment expansion would not create an acute angle in the route.~~

~~testing the at least one potential route segments to determine whether it creates an acute angle in the route; and~~

~~_____ c) preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route.~~

20. (Currently Amended) The computer readable medium of claim 19 wherein an acute angle is created in the route when a ~~route segment in the route connects with a start or target geometry~~ two route-segment expansions connect at an angle of less than 90°.

21. (Currently Amended) The computer readable medium of claim 20 wherein:
the computer program further comprises sets of instructions for:

defining at least one border region about the start or target geometry; and

defining at least one routing rule associated with the border region; and

~~the set of instructions for b) testing the at least one potential route segment~~
~~comprises a set of instructions for determining whether a the potential route segment expansion~~
is within the border region; and

upon determining that the ~~potential~~ route-segment expansion is within the border region, testing the ~~potential~~ route-segment expansion to determine if the ~~potential~~ route-segment expansion meets the associated routing rule.

22. (Currently Amended) The computer readable medium of claim 21 wherein the routing rule prohibits particular routing directions within the border region that would result in an acute angle being formed at a connection point between a route-segment expansion in the route and a start or target geometry.

23. (Original) The computer readable medium of claim 21 wherein:

the border region neighbors a side of the start or target geometry having a vertical or horizontal orientation; and

the routing rule prohibits diagonal routing directions within the border region.

24. (Original) The computer readable medium of claim 21 wherein:

the border region neighbors a side of the start or target geometry having a diagonal orientation; and

the routing rule prohibits vertical or horizontal routing directions within the border region.

25. (Currently Amended) A computer readable medium that stores a computer program for routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the computer program comprising sets of instructions for:

a) during said routing:

i) producing a set of route-segment expansions comprising at least two ~~potential route segment~~ route-segment expansions;

b) ii) ~~testing the potential route segment a route-segment expansion to~~
determine whether it ~~would create~~ creates an acute angle in the route;

e) iii) ~~preventing the at least one potential route segment tested route-~~
~~segment expansion~~ from being included in the route between the start and target geometries if
~~upon determining that the tested route-segment expansion potential route segment produces~~
would produce an acute angle in the route;

d) iv) ~~including the tested route-segment expansion potential route~~
~~segment~~ in the route between the start and target geometries ~~upon determining that the potential~~
~~route segment if the tested route-segment expansion would~~ does not produce an acute angle in
the route; and

f) v) ~~iteratively repeating the sets of instructions for i), ii), iii), and iv)~~
~~a), b), e), and d).~~

26. (Currently Amended) The computer readable medium of claim 25 wherein:

a ~~route segment~~ route-segment expansion comprises an interconnect line or a via;
and

an acute angle is created in the route when a ~~route segment~~ route-segment
expansion ~~in the route~~ connects with another ~~route segment~~ route-segment expansion ~~in the route~~
at an angle of less than 90°.

27. (Currently Amended) The computer readable medium of claim 26 wherein the set of instructions for b) testing the route-segment expansion potential~~route-segment~~ comprises a set of instructions for referring to a pretabulated configuration table to determine whether the route-segment expansion potential~~route segment creates~~ would create an acute angle in the route.

28. (Original) The computer readable medium of claim 27 wherein the configuration table is a line-to-line configuration table that contains various connection configurations between two interconnect lines and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

29. (Original) The computer readable medium of claim 27 wherein the configuration table is a line-to-via configuration table that contains various connection configurations between an interconnect line and a via pad of a via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

30. (Original) The computer readable medium of claim 27 wherein the configuration table is a via-to-via configuration table that contains various connection configurations between a first via pad of a first via and a second via pad of a second via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

31. (New) A method of generating a route, said method comprising:

- a) identifying a plurality of potential path expansions wherein each potential path expansion except a first potential path expansion comes from an immediately preceding potential path expansion and each potential path expansion has a direction;
- b) wherein identifying a potential path expansion comprises:
 - i) comparing the direction of a potential path expansion with the direction of the immediately preceding potential path expansion;

ii) determining whether the direction of the potential path expansion forms an acute angle with the direction of the immediately preceding potential path expansion;
and

iii) discarding the potential path expansion if it would form an acute angle with said immediately preceding path expansion.